

THE 22 S'RUTIS OF INDIAN MUSIC

A Complete Exposition

Being a Lecture delivered before the Bombay Branch

of the

Royal Asiatic Society on 22nd April 1931



BY

M. R. Telang

Retired Head S'irastedar of
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PREFACE

The present lecture was delivered before the Bombay Branch of the Royal Asiatic Society on the 22nd of April 1931 in the earnest hope that it would soon be printed, and published in the Society's Journal and thus attract the attention of Research Scholars in the different parts of the world. But as it has not yet found a place in the Society's Journal, it has been published independently with a view to elicit the verdict of Antiquarian Scholars on the original research, embodied in the paper, on the 22 S'rutis of the Ancient Indian Music of Bharata, a subject which has been a matter of protracted and unsettled controversy.

In this connection the valuable assistance rendered by my esteemed friend Mr. M. R. Nadkarni, B. A., Assistant Master, Satara High School, deserves special mention. Grateful acknowledgments are also due to Dr. N. G. Sardesai, L.M.S., Proprietor of the Oriental Book Agency, Poona, for undertaking the printing and publication of this pamphlet.

Bombay
29th March 1933

M. R. Telang.

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THE EXPOSITION OF THE 22 S'RUTIS OF INDIAN MUSIC.

Of late years in India the subject of Indian music has grown into great favour. It has evoked such marked enthusiasm that much controversy has raged around it, much research has been undertaken and many books have been brought out thereon in English, Marathi, Gujarati, Hindi and even Sanskrit.

In some of these works an attempt has been made to reconcile the 22 S'rutis of ancient Indian music with the octave of the present day. But in none of these works has any satisfactory explanation of the following amongst other knotty points been furnished:—

- (1) Which was the natural scale propounded by Muni Bharata ?
- (2) Why have only 22 S'rutis been prescribed for one octave ?
- (3) Why have only three S'rutis been considered to constitute Rṣabha and Dhaivata instead of four ?
- (4) How many S'rutis constitute the Komala Rṣabha and the Komala Dhaivata of the current music ? And what notes in Bharata's system correspond to them ?

The foregoing points are such as may well exercise the mind of any earnest student of music and naturally they formed a topic of close investigation with me. I have arrived at certain conclusions as a result of my investigation of these points, after a careful and thorough study of the Science of music by Bharata, the Brihaddesi of Mataṅga, the Sangita Ratnākara of Śāringdeva and other works. These results are such as will dispel all sorts of doubts concerning the points in question. The same I am going to place before you with your indulgence to day.

I think I owe to you all a short account of my connection with the subject of Indian music and of the occasions that led me to the investigation of the foregoing knotty questions.

In the year 1877 the idea occurred to me of learning the art of playing upon the Satār and I forthwith commenced my efforts. Three years later on I went to Baroda to live with my elder brother, the late Mr. Puruṣottamrao Telang who was fully conversant with all the minutiae of the present day Indian musical system. There he took occasion to introduce me to the great masters of Indian music : to the noted Satārist Mr. Pānhālāl Gosāiji and the renowned Been player Mr. Ali Hussain Khān and to celebrated vocal musicians Khādim Hussain Khān Amrohiwāla, Faiz Mohamadkhān, Prof. Maulā Baksha and others.

My acquaintance with these experts afforded me uncommon facilities for listening to high class music both vocal and instrumental.

I picked up the art of playing on the Satār from Mr. Panāhlāl, theory of current music from Prof. Maulā Baksha, the construction and composition of Rāgas (Ālāpa or Joda) from Khādim Hussain Khān, the style of Vilambapada in Been music from Ali Hussain Khān.

In 1882 I returned to Bombay and resided there as I got a berth in the Bombay High Court. Here during my leisure time I pursued my practice of playing on Satār and Been and commenced the study of the Sangita Pārijāta of Ahobalabhatta in order that I might understand the theory of ancient Indian music.

In spite of my close study of that book one point remained obscure to me, namely, the natural scale accepted by its author. A little later my attention was drawn to the rules laid down in the above mentioned book for fixing the notes on the Viñā. And according to the rules I carried out experiments on the Satār. Then I found that the natural octave

according to Ahobala Pandita coincided with the scale of Kāfi Rāga of the present day. But at the same time it struck me that the Purva Rṣabha, the Komala Rṣabha, the Purva Dhaivata and the Komala Dhaivata mentioned by the author with respect to the Viñā do not correspond to the current Komala Dhaivata and Komal Rṣabha. Nevertheless, I had succeeded in the important discovery that the natural octave of Ahobalabhatta was the current scale of the Kāfi Rāga. And this discovery I communicated in 1883 to many of my friends interested in music.

In 1889, the late Mr. Mahadeo Chimanaji Apte, Vakil, Bomby High Court and the Founder of Ānanda Āshrama of Poona, entrusted me with the work of editing the Sangita Ratnākara. This work of editing the book was completed in 1897 and it was published in the Ānandāshram Series.

Later on, I looked into that portion of the 28th chapter of Bharatanātya Sāstra which deals with S'rutis and Notes. There, too, I found that a number of S'rutis in the Notes that go to make up the natural octave laid down by the Bharata Nātya Sāstra and Sangita Ratnākara was exactly that laid down in the Pārijāta. Hence I concluded that the natural scale as propounded by the former two books also, was the scale of Kāfi Rāga. Next I looked into the Rāgavibodha the Sangitdarpaṇa and other Sanskrit works on music. In these works too, I noticed the same rules prescribed with regard to S'rutis as in the Sangita Ratnākara. But in none of these works did I come across any explanations as to why the number of S'rutis was fixed at 22, why the sharp Rṣabha and sharp Dhaivata were assigned three shrutis each, on what S'rutis of Bharata the flat Rishabha and the flat Dhaivata now accepted by Indian Musicians are to be fixed etc.

As the ancient works of Bharata and others happened to have been written in a brief compass and in technical phraseology, ordinary Sanskritists fail to understand them properly. As this was the case at the time of my first attempt

with the book and as the question relating to the Shrutiś could not be solved with its help, I suspended the study of the topic for a time. And I turned my attention to the study of Sanskrit works on Nyāya, Mimānsā, Vedānta etc. At this very time, the renowned master of music Allādiakhān came to Bombay to stay and I employed my time in securing from him much valuable information relating to Rāgas etc. of the current system of music in our country.

In 1902, Mr. Ganpatrao Gopālrao Barve brought to me the manuscript copy of a book named Nādalahari written by him on S'rutiś, notes and the current scale. In that book he had made an attempt to reconcile the current Bilāvala scale with the 22 S'rutiś mentioned in the following s'loka :—

चतुश्चतुश्चतुश्चैव पद्ममध्यमपञ्चसाः ।
द्वे हे निषादगान्धारौ त्रिखिर्क्षपभैवतौ ॥ ”

I proved to him that the scale formed according to the S'rutiś laid down in the s'loka was not the Bilāvala scale but the scale of the Kāfi Rāga. Thereupon he made the necessary correction in his book and also published therein the incident of his visit to me and the consequent emendation of the error (vide pp. 119-121, Nādalahari).

Some years later, i. e. in 1913, I retired to Kārwār on pension and settled down there. There my time was employed in reading books upon Nyāya, Mimānsā, Vedānta etc. and in playing upon the Been. And the topic of the S'rutiś received no attention whatever at my hands for some years.

In 1929, I started on a tour to South India and visited many holy places there in Cochin, Travancore etc. and proceeded as far as Tanjore. In some of these places I came across many noted Instrumentalists and vocalists of that part of India. There it occurred to me to try and secure from them some information at least with regard to the natural scale of Bharata the Shrutiś etc. But my attempt in this direction

proved absolutely futile as their system of music is different from that of Bharata.

Thence I went on to Tiruvādi. There I met with a learned S'astri by name Shaila Tātāchārya. He told me that he had been writing a commentary on the ancient work namely Bhāmahālankāra and showed me two unintelligible S'lokas relating to music namely, the 33rd and the 34th occurring in the fourth chapter of that work. He sought my help in elucidating the meaning of the two S'lokas and I assured him that on my return to Kārwār I would look into the books on music that I had at home and send him the meaning that he was in quest of.

In January 1930, I returned to Kārwār and set myself earnestly to the trying task of ascertaining the meaning of the two obscure S'lokas. These are :—

“ कलासङ्कलना प्रज्ञा शिल्पान्यस्याश गोचरः ।
विपर्यस्तं तथैवाहुस्तद्विरोधकरं यथा ॥ ३२ ॥
ऋषभात्यञ्चमात्स्मात् सप्तुं धैवतं स्मृतम् ।
अयं हि मध्यमग्रामो मध्यमोत्पीडितर्पभः ॥ ३३ ॥
इति साधारितं मोहादन्यथैवावगच्छति ।
अन्यास्वपि कलास्वेवमभिधेया विरोधिता ॥ ३४ ॥ ”

भास्महालङ्कार परिच्छेद, ४

In the first of the three S'lokas stated above Bhāmaha, the author, has given the characteristic of a fault in poetry styled " Viparyasta " (perversion). In the succeeding two S'lokas he has given instances of the wrong definition that ill-trained people usually frame, of the terms Swarasādhāraṇa and Madhyamagrāma occurring in the science of music.

In this connection, I was obliged to closely study these parts of Bharata Nātyas'āstra and Bṛhaddeśi that related to the S'rutiś, the grāmas etc. After much effort I succeeded in clearing up the meaning of the obscure S'lokas and sent the same to Tātāchārya.

It is noteworthy that the portions of the Bharata Nātya-śāstra and the Bṛhaddeshi by means of which I was able to arrive at the meaning of the obscure S'lokas referred to me by Tātāchārya, placed me in possession of an unexpected quantity of knowledge with reference to music and helped me in solving my difficulties namely, those that I have mentioned in the introductory portion of this paper and gave me a rare insight into the theory of Bharata's S'rutis. For this reason I state them below:—

“अथ द्वौ ग्रामौ पद्मजो मध्यमश्चेति । तत्राश्रिता द्वाविंशतिः श्रुतयः ।
यथा—

तिस्रो द्वे च चतुर्स्रश्च चतुर्स्रस्तिस्र एव च ।

द्वे चतुर्स्रश्च पद्मजाख्ये ग्रामे श्रुतिनिर्दर्शनम् ॥ २२ ॥

मध्यमग्रामे तु श्रुत्यपकृष्टः पञ्चमः कार्यः । पञ्चमस्य श्रुत्युत्कर्षपार्क-
पार्क्ष्यां यदन्तरं मार्दवादायतत्वाद्वा तावत्प्रमाणश्रुतिः ।

निर्दर्शनं च समभिव्याख्यास्यामः । यथा द्वे वीणे तुल्यप्रमाणतंत्र्युपवा-
दनदण्डमूर्च्छने पद्मजग्रामाश्रिते कार्ये । तयोरन्यतरीं मध्यमग्रामकीं कुर्यात् ।
पञ्चमस्यापक्षे श्रुतिं तामेव पञ्चमस्य श्रुत्युत्कर्षवशात् पद्मजग्रामकीं कुर्यात् । एवं
श्रुतिरपकृष्टा भवति । पुनरपि तद्वदेवापकर्षात् गान्धारनिषादावपि इतरस्यां
धैवतर्पर्वभौ प्रविशतः । श्रुत्यधिकत्वात् । पुनस्तद्वदेवापकर्षाद्वैवतर्पर्वभावितरस्यां
पद्मजपञ्चमौ प्रविशतः । श्रुत्यधिकत्वात् । तद्वपुनरपकृष्टायां तस्यां पञ्चम-
मध्यमपद्मजा इतरस्यां मध्यमनिषादगान्धारवन्तः प्रवेक्ष्यन्ति । चतुःश्रुत्यधि-
कत्वात् । एवमनेन श्रुतिर्दर्शनविधानेन द्वैग्रामिक्यो द्वाविंशतिः श्रुतयः
प्रत्यवगन्तव्याः । ”

भरतनाथ्यशास्त्र, पृ. ३१८, प. २२ (काशीमुद्रितम्).

Meaning:—“Sadja and Madhyama are two grāmas. In each of these grāmas there are 22 S'rutis, three for Rśabha, two for Gāndhāra, four for Madhyama, four for Panchama, three for Dhaivata, two for Niśad and four for Sadja.

Reduce the number of Shrutis in the Panchama of the Madhyama grāma by one (the number of Shrutis in the Panchama of the Sadja grāma is increased by one of course).

Then the difference that results, when the S'rutis of the Panchama are either increased or reduced by one i. e. the difference between the new and old positions of Mṛidu Jāti or the difference between the new and old positions of Āyatā Jāti constitutes a S'ruti. (प्रमाणश्रुतिः)

The following is the illustration:—Construct two Veena of equal dimensions, strings etc. and containing the Śadja grāma. Next fit one of these up with the Madhyama grāma (i.e. without making any change in the notes in the 2nd Veena). Consider the note Madhyama to be the keynote. Reduce the S'rutis of the Panchama by one and add it to the Panchama of the Śadja grāma. Now you will see in the Veena of the Madhyama grāma there is one S'ruti less. Again, if you reduce the S'rutis of the Panchama further by one, the Gāndhāra and Niśada in the Śadja Grāma Veena coincide with Rśabha and Dhaivata of the Madhyama grāma Veena. The reason is the addition of the one more S'ruti still, the Śadja grāma has received on the whole an addition of two S'rutis. In the same way if the S'rutis of the Panchama are further reduced by one, the Rśabha and the Dhaivata in the Śadja grāma Veena coincide with the Śadja and the Panchama of the Madhyama grāma Veena, the reason being that the Śadja grāma is further enriched by one S'ruti. (The Śadja grāma is thus increased by three S'rutis in all). If this process be carried on further by reducing once again the S'rutis of the Panchama in the Madhyama grāma Veena by one, the Panchama, Madhyama and Śadja of the Śadja grāma Veena coincide with the Madhyama, Gāndhāra and Niśada of the Madhyama grāma Veena respectively, because the Śadja grāma has received an addition of 4 Shruti in all. By the same process the 22 Shruti of the two grāmas should be understood.”

How these 22 Shruti can be arrived at by this process has been fully explained in the Bṛhaddesi in a passage which is quoted below:—

Extract from Brhaddeshi:—

“ननु श्रुतेः किं मानम् । उच्यते । पञ्चमस्तावद्ग्रामद्वयस्थो लोके प्रसिद्धः । तस्योत्कर्षणापकर्षणाभ्यां मार्दवादायतत्वाद्वा । यदन्तरं तत्प्रमाणश्रुतिः ॥ ”

मतङ्गकृतबृहदेशी पृ. ५, पं १८;

also in संगीतरत्नाकर सिंहभूपालटीका पृ. ४३, पं. ६.

“चलवीणायाः प्रथमोत्कर्षे श्रुतिलाभो नास्ति । द्वितीये चतुःश्रुतिलाभः । तृतीये षट्श्रुतिलाभः । चतुर्थे द्वादशश्रुतिलाभः । एवं द्वाविंशतिभेदभिज्ञाः श्रुतयो दर्शिताः । ”

मतङ्गकृतबृहदेशी, पृ. ६, पं. १२

Meaning:—“Querry—what is the measure of a S'ruti? Answer:—You know what Panchama is in the two grāmas. Now increase or decrease the Panchama (by one) and notice the difference resulting from the movement of either Mṛdu or Āyatā Jāti, constitutes the measure of the S'ruti.” (प्रमाणश्रुतिः)

In the foregoing extracts Mataṅga has explained the view of Bharata. And in order to show that the Panchama in the two grāmas is the same, the word Panchama is used in the singular number and he has further asserted that the Panchama is well known to the masters of music, the object being to show that the Panchamas in the two grāmas do not differ at all.

If the moving Veeṇa that is the Śadja grāma Veeṇa is pushed up by one S'ruti, the notes in that Veeṇa do not obtain the benefit of coinciding with any notes in the stationary Veeṇa. If the Śadja grāma Veeṇa is pushed up two Shruti, the Gandhār and Niṣāda receive two S'rutis each. Thus there is an increase of 4 S'rutis in all. (Here the desired coincidence of the notes is attained). Further if the Śadja grāma Veeṇa is pushed up by three S'rutis there is again a coincidence of notes in the two Veeṇas and six S'rutis are obtained; 3 for the Rṣabha of the Śadja grāma Veeṇa

and 3 for the Dhaivata. If the Śadja grāma Veeṇa be further shifted upwards by four S'rutis, 12 S'rutis are obtained, four for the Panchama, four for the Madhyama and four for the Śadja. Now the total obtained is $4 + 6 + 12 = 22$.”

The meaning of the quotations given above did not flash upon my mind on the spot. I was put to the necessity of closely analysing the quotations and getting at their core. Many doubts and difficulties occurred to my mind during this period and in the end I arrived at a satisfactory explanation. The same I am going to present to you to-day. Bharata has laid down four S'rutis for the Panchama and three for Dhaivata in the Śadja grāma. And strangely enough he has also asserted that in the Madhyama grāma 3 Shruti should be assumed for the Panchama and four for the Dhaivata though these notes are not altered in pitch and position. In this connexion, I did not understand how it was that the Panchama lost one S'ruti and Dhaivata gained one. The following solution occurred to me in course of time. The moment the Panchama is reduced by one S'ruti, the four S'rutis viz.—Kshiti, Raktā, Sandipani and Ālāpini of the Panchama which come close on the heels of the Madhyama suffer a descent of one S'ruti and the place of Kshiti in the immediate neighbourhood of Madhyama becomes vacant; and since Kshiti takes the place of Raktā, Raktā and Sandipani respectively assume the positions previously occupied by Sandipani and Ālāpini. Inasmuch as Ālāpini passes into the region of Dhaivata and increases its S'rutis by one, I assumed that there must previously be a vacant place for a S'ruti though that place may not have been assigned by name. Thus I concluded that by the loss of one S'ruti the Panchama became a note of three S'rutis, while Dhaivata by the gain of one S'ruti became a note of four S'rutis.

But a new question arose in my mind as to the reason for reducing the S'rutis of the Panchama by one in the Madhyama grāma. This question was solved by me in the following

manner. The solution is based on a rule laid down by the masters of music as a result of their experience, namely that two notes whose mutual distance is only one S'ruti are mutually discordant, that is, are prejudicial to the production of melody. The rule is embodied in the following verse:—

“ एकश्रुत्यन्तरितौ विवादिनौ वैरिणौ मिथो भवतः । ”

रागविवोध पृ. २७, पं. १९

Hence it follows that a note lying at a distance of one S'ruti from another cannot be taken along with that note owing to the two notes being discordant with each other. Therefore one of the two notes has to be left out. But as Sadja and Panchama are steady or dominant notes, neither of them can be left out in any complete scale. The first S'ruti of Rṣabha or Dhaivata in their immediate neighbourhood being discordant or Vivādi have to be omitted. According to this rule in the Madhyama grāma, the Madhyama note being dominant, the first S'ruti of Panchama lying in the neighbourhood of Madhyama has to be deleted on the ground that it is discordant, that is, prejudicial to melody. Thus the Panchama of the Madhyama grāma became a note of three S'rutis instead of four. This is the solution.

It was according to this very rule that the ancient masters of music like Bharat did not assign specific names to the first S'rutis of Rṣabha and Dhaivata even in the Sadja grāma and omitted them from the range of the S'rutis altogether. Thus Rṣabha and Dhaivata come to have three S'rutis in the place of four. This was the conclusion arrived at by me.

In order to support this conclusion I began to search for authority in ancient works on music but I did not come across any passage in the works of Bharata and Mātaṅga pointing to the omission of a shruti in the case of Rṣabha and Dhaivata. Nevertheless there are reasons for supposing that the authors of the two books support the view I have held. These reasons are detailed below:—

Reason No. 1 :—Bharat says in his Nātyaśāstra that two notes whose mutual distance consists of nine or thirteen S'rutis should be considered to be mutually concordant (Samvādi) or capable of enhancing each other's melody. Even later writers namely Dantila and Mātaṅga recognise the same number of S'rutis as constituting the interval between two concordant notes. The passages from their works in reference to this view of theirs are the following:—

“ ययोश्च नवकत्रयोदशश्रुत्यन्तरे तावन्योन्यं संवादिनौ, यथा पद्मज-
मध्यमौ पद्मजपञ्चमौ । ”

भरतनाट्यशास्त्र पृ. ३१०, प. २०

“ द्विनिलेनाप्युक्तम्—‘मिथः संवादिनौ ज्ञेयौ त्रयोदशनवान्तरौ । ’”

संगीत रत्नाकर सिंहभूषणलटोका पृ. ५३, पं. ४

“ नवकत्रयोदशान्तराः संवादिनः । ”

बृहदेवी पृ. १६, पं. ६

Bharata recognises Madhyama and Panchama to be the notes concordant with Sadja. It follows from this that there should be nine S'rutis between Sadja and Madhyama and an interval containing thirteen S'rutis between Sadja and Panchama. Now if we assume three S'rutis for Rṣabha then the interval between Sadja and Madhyama consists of eight S'rutis and that between Sadja and Panchama, of twelve. That means, the two notes in either case, cannot become concordant but this is a contradiction of the dictum of Bharata. Therefore, Rṣabha must have originally contained four S'rutis and not three. Similarly, if we assume only three S'rutis for Dhaivata, the interval between Rṣabha and Dhaivata comes to be one of twelve S'rutis only. Therefore, these two notes cannot be called concordant but they should be regarded as concordant to the rule. They can be so only when as I have suggested above, the S'ruti omitted from Rṣabha and Dhaivata is duly taken into account, because then we get the nine and the thirteen S'rutis respec-

tively prescribed by Bharata as the distance between the concordant notes. To my mind Bharata must have framed his rule regarding concordant notes with a full consciousness of the existence of the two discordant S'rutis though these were not particularly honoured with any names. And this rule about the concordant notes nowhere comes in conflict with the system of Indian music and one may be justified in assuming the existence of two S'rutis, besides the twenty two named by Bharat in his musical scale.

Reason No. 2 :—Several centuries after Bharata, Dāntila and Mataṅga, Sāṅgadeva wrote his *Sangita-Ratnākara* in the 13th century. In this work he has abandoned the rule laid down by Bharata, namely that there should be an interval of nine and thirteen S'rutis between two concordant notes and affirmed that any two concordant notes need only eight and twelve S'rutis only for separating them. This rule is embodied in the following quotation :—

“ श्रुतयो द्वादशाष्टौ वा ययोरन्तरगोचरः ।
मिथः संवादिनौ तौ स्तो निगावन्यविवादिनौ ॥ ”

संगीतरत्नाकर, पृ. ४३, पं. ३३

But he has not stated the reasons for rejecting the dictum of Bharat in regard to the concordant Sāmvadi notes. Kallinātha and Simha Bhupāla, the commentators on *Sangita Ratnākara* have tried to explain away the inconsistency by stating that the nine and the thirteen S'rutis laid down by Bharata include the S'uti in which the Samvādi note originates. The following extracts from the commentaries fully bear this out.

“ त्रयोदशनवान्तरमिति मतङ्गोक्तस्यापि द्वयोरेकस्वराधारश्रुत्या संवादिलक्षणस्यापि द्वादशाष्टान्तरत्वमेवेत्यर्थः । ”

संगीतरत्नाकर कल्लिनाथटीका, पृ. ४४

“ ननु मतङ्गेन त्रयोदशनवश्रुत्यन्तरत्वेन संवादित्वमुक्तं, तथाहि,—
‘ संवादित्वं तु पुनः समश्रुतिक्त्वे सति त्रयोदशनवान्तरत्वे चान्योयं बोद्धव्यम् ’

इति । दन्तिलेनाप्युक्तम्—‘ मिथः संवादिनौ ज्ञेयौ त्रयोदशनवान्तरौ ’ इति । तत्कथमुच्यते श्रुतयो द्वादशाष्टौ वा ययोरन्तरगोचर इति । उच्यते । ययोः श्रुत्योः स्वरौ अवस्थितौ ते श्रुती विहाय मध्यस्याः श्रुतयो द्वादशाष्टौ वा यदि भवन्ति तदा तयोः संवादित्वमित्यनेनाभिप्रायेणैवोक्तम् । मतङ्गादिभिस्तुयो यस्य संवादी तस्यावस्थानश्रुतिमपि मध्ये गणयित्वा त्रयोदशनवान्तरवित्युक्तमिति न कश्चिद्विसंवादः । ” इति ।

संगीतरत्नाकर सिंहभूपालटीका, पृ. ५३, प. २

But the concordance of *Tivra Rśabha* and *Panchama* can hardly be established whether the rule laid down in the *Ratnākara* in this connection is followed or the explanation of Simha Bhupala, is accepted. For, there can be neither more or less than nine S'rutis between those two notes. These can be concordant according to Bharata's rule as has been proved above. Hence it follows that we should assume the existence of two S'rutis one of which is prejudicial to *Sadja* and the other to *Panchama*.

Reason No. 3 :—An important pronouncement in this behalf occurs in Mataṅga's *Bṛhaddeshi* viz:—

“ उभयतो द्वाविंशतिः, एवं ग्रामद्वयेऽप्युपयोगिन्यः श्रुतय इति दर्शिताः । ”

मतङ्गकृतबृहदेशी, पृ. १०, पं. ५,

In this extract Mataṅga says that he has indicated twenty-two S'rutis and that these alone are of service. The assertion that twenty-two S'rutis indicated by him are serviceable prompts one to infer that in his view there were also unserviceable S'ruits at the same time. If there had not been unserviceable S'ruits in his system, there would have been no occasion for the application of the epithet “serviceable” to any shruti at all. Thus it is clear that in the musical scale there are unserviceable S'rutis along with serviceable ones in an octave. The S'rutis immediately following *Sadja* or *Panchama* are admittedly unserviceable. Hence the number of unserviceable S'rutis is two and since these two are unserviceable, they are generally deleted from overt enumeration.

Reason No. 4:—Bharata, as has been mentioned above, has laid down three S'rutis for Rṣabha and Dhaivata respectively. This led the later writers on music to divide the interval between Sadja and Rṣabha into three equal parts and to recognise three Rṣabhas. According to this scheme the Komala Rṣabha of modern music does not coincide with any of these sub-divisions of Rṣabha. The same sort of difficulty crops up with respect to Komala Dhaivata, but if we assume the existence of a primal inarticulate Shruti for Rṣabha and Dhaivata respectively, as I have propounded above, these two notes come to be of four S'rutis each and the Komala Rṣabha and Komala Dhaivata coincide with the second subdivision of the said notes. Further, the S'uddha Rṣabha and the S'uddha Dhaivata of ancient Indian Music which correspond to 'Tivra' Rṣabha and 'Tivra' Dhaivata coincide with the fourth subdivisions, inasmuch as the place of origin of Komala Rṣabha and Komala Dhaivata cannot be satisfactorily comprehended without assuming the two unserviceable S'rutis discussed above, the admission of the existence of these two S'rutis is inevitable.

Reason No. 5:—If one recognizes four S'rutis for the intervals between Niṣāda and Sadja, Gāndhāra and Madhyama or Madhyama and Panchama, one to be consistent has also to recognize four S'rutis for the intervals between Sadja and Rṣabha on the one hand and Panchama and Dhaivata on the other. Another and more cogent reason for doing this is furnished by the fact that in case one assumes three S'rutis for each of these intervals in the place of four, one finds that the extent of a S'uti belonging to these intervals differs materially from the extent of the S'rutis in the other intervals in the musical scale. In consequence, the rule that the higher the pitch the shorter should be the extent of a S'uti becomes infringed. This clearly points to the fact that the interval whether between Sadja and Rṣabha or

between Panchama and Dhaivata consists of four S'rutis only and these four S'rutis can be arrived at by the addition of one Vivādi or unserviceable shruti to the three serviceable S'rutis prescribed by Bharata. From the reasons detailed above, it is clear that Bharata and other older writers had recognized 24 S'rutis in fact in their octave and as 22 of these were serviceable they brought them into use and assigned names to them, while the remaining two S'rutis being unserviceable were not honoured by them with any specific names. The positions of these two unserviceable S'rutis remained all the same and claimed recognition when the occasion arose for ascertaining the concordant (Samvādi) notes.

The scientific exposition made by me so long with regard to the S'rutis etc., has no particular bearing upon the present-day musical system for this reason that the structure of the present-day musical system does not depend upon S'rutis, Jātis, Grāmrāgas etc., like the ancient musical system constructed by Bharata and others. The current system rests upon the Deshi Rāgas which were composed by later musicians at different times.

There is a widespread belief handed down from generation to generation among renowned musicians of recognized schools of Indian music in Northern India that there are fourteen systems of science and that the present is one of them, being based upon the principles of Hanumān and this belief has been vouched for by the esteemed masters of music—Tānaraskhān, Kāhdīm Hussainkhān and others. Proofs of Hanumān having been one of the ancient authors of music are available in different books. In Sangita Ratnākara and Kallintāthās commentary thereon, in Sangita Pārijāta, Sangita Darpaṇa, Rāgavibodha etc., there are references to Hanumān as a writer on music and there are also one or two quotations from his book. The following are the extracts in which occur references to the name of Hanumān:—

“ आज्जनेशो मातृगुप्तो रावणो नन्दिकेश्वरः । ” सं. र. ष. ६, पं. १
 “ कर्ता संगीतशास्त्रस्य हनूमांश्च महाकपिः । ” सं. पारि. ष. १, पं. १७
 “ ग्रामशुतिस्वरादेरनियम उक्तो हनूमताद्येन ।

देशीरागे 'येषां श्रुतिस्वरादि' पद्येन ॥ ” रागविबोध, ष. २६, पं. ५
 The succeeding are the quotations from Hanumān's writings :—

“ तथा चाहाज्जनेय :—
 येषां श्रुतिस्वरग्रामजात्यादिनियमो न हि ।
 ननादेशगतच्छाया देशीरागास्तु ते स्मृताः ॥ ”
 संगीतरत्नाकर कल्लिनाथटीका, ष. २१८, पं. २
 “ अत्र आज्जनेय :—
 नादाभ्येत्सु परं पारं न जानाति सरस्वती ।
 अयापि मज्जनभयात्तुम्बं वहति वक्षसि ॥ ” संगीतदर्पण, ष. १४, पं. ३

In the last but one extract made by Kallinātha from the work of Hanumān, the latter says that the rule regarding Shruti, Grāma, Jāti, etc., does not apply to the Deshi Rāgas. And since we find that the characteristics of the Desh-Rāgās as propounded by Hanumān are applicable to the current music, this music is admittedly one of Deshi Rāgas only. There is every possibility also of its being based upon the traditional belief among the living masters of music.

In the current system, each octave contains twelve notes of which Sadja and Panchama are regarded as Achala or fixed and each of the remaining five notes Rṣabha, Gāndhāra, Madhyama, Dhaiyata and Niṣāda is split up into two varieties, the one being called Komala or flat and the other, Tivra or sharp, and no minor varieties like Atikomala and Tivratara have received any recognition. On this account this system became easy to follow and Bharata's scheme of S'rutis fell into abeyance.

At the present time accomplished singers sing their traditional Rāgas and also other musical composition like

Dhrupad, Dhammār, and Khyāl. But if one were to undertake an enquiry into their theory in ancient books, one's efforts would turn positively futile. It is for this reason that those ancient works are in no way useful to the student of modern music. Like a language the art of singing too, is subject to change from time to time. Whenever a language undergoes changes, alterations have to be introduced into its grammar corresponding to those changes. In an exactly similar manner corresponding to the changes that take place in the art of singing, modifications have to be made in the theory of it. It is in view of this very principle that Sāṅgadeva has written the following verse in his Sangita Ratnākara :—

“ यदा लक्ष्यप्रधानानि शास्त्राण्येतानि मन्वते ।
 तस्मालक्ष्यविरुद्धं यत्तच्छास्यं नेत्रमन्यथा ॥ ”

संगीतरत्नाकर ष. ५१६ पं. ३

Meaning :— “Writers on music hold the view that practical music is the main concern in that science. Therefore, one should place a new interpretation on the rules in regard to the different parts of the science and bring the theory into harmony with the system of singing actually in vogue.”

The prevailing system of music owed its development and perfection to such geniuses as Haridās Tāgore, Tānasen, Bajru Bāware, Sadāranga and Adāranga of the last four hundred years and has been transmitted by one generation to another down to the present day. In my opinion it behoves the musical experts of the day and generation to construct rules in consonance with the current practice of music as has been so happily recommended by Sāṅgadeva.

From this my brief reference to the nature of the music now in fashion it is clear that the arrangement based upon S'rutis has passed out of use. Nevertheless, the people interested in carrying out researches among ancient works on

music like those of Bharata, the origin of the S'rutis as expounded above by me is sure to be highly useful.

In the foregoing exposition, all the questions that were brought up for discussion in the first part of this paper have received their solutions. These solutions deserve particular attention and, therefore, I have drawn up the following summary thereof:—

(1) The number of S'rutis prescribed by Bharata for each note in his natural scale is exactly equal to the number of S'rutis contained in the current scale of Kāfi Rāga, hence the natural scale of Bharata is no other than the current scale of Kāfi Rāga.

(2) Bharata recognized in the first instance 24 S'rutis in an octave assigning four to Sadja, four to Rṣabha, two to Gāndhāra, four to Madhyama, four to Panchama, four to Dhaivata and two to Nishāda, but on the ground that the first Shruti of Rṣabha below Sadja as also the first S'ruti of Dhaivata below Panchama were discordant and, therefore, prejudicial to melody, he refrained from assigning names to them and as the remaining 22 were serviceable to melody he conferred prominence on these by the bestowal of special names. Since Bharata made no pointed reference to the discordant S'rutis they remained in the back-ground and 22 serviceable śrutis alone attained celebrity and recognition.

(3) Rṣabha and Dhaivata had each of them four S'rutis in the first instance but by reason of the first S'ruti of each of them proving unserviceable it escaped enumeration and each of these notes became one of three S'rutis. Still these two unserviceable S'rutis must be duly taken into account when the interval between two concordant notes comes to be computed, according to Bharata's rule which prescribes either 9 or 13 S'rutis for the said interval.

(4) The first unserviceable S'ruti taken along with three serviceable Shrutis constitute four Shrutis for Tivra

Rṣabha and Tivra Dhaivata respectively. And the Komala Rṣabha and the Komala Dhaivata of the current musical system coincide with the second S'rutis of the two notes. That is they coincide with the first serviceable Shrutis of the two notes. When one recognizes three S'rutis in the place of four after the manner of Bharata.

Thus far I have placed before you my exposition of the Shrutis in ancient music.

In my earnest study of music as a science as well as an art, the problem of the Shrutis had formed a subject of anxious research with me for several years. Even in 1883, I did not succeed in getting beyond the only discovery that the natural scale of ancient Indian music answered to the present scale of the Kāfi Rāga. But later events especially those that transpired in 1930 gave a powerful impetus to my mind with respect to this topic and crowned my humble efforts at last. Grati-fied as I feel at the success of my efforts I experienced still greater pleasure in placing the results of my research at the disposal of accomplished people like you for the highest satisfaction, as you will all admit, lies in rendering one's quota of service, however humble, to one's fellow beings.

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INDIAN MUSIC
Supplement I

Sadja Grāma Veṇa of
Bharata called Chala
Veṇa ba Matanga.
Panchama 4 S'rutis
Dhaiyatā 3 S'rutis
In Sadja Grāma

Madhyama Grāma Veṇa
of Bharata called Dhruwa
Veṇa by Matanga.
Panchama 3 S'rutis
Dhaiyatā 4 S'rutis
In Madhyama Grāma.

4	Chandowati	Madhyā	स C	स C	Madhyā	Chandowati	4
0	(omitted as discordant)				(omitted as discordant)		0
5	Dayāwati	Karuṇā			Karunā	Dayāwati	5
6	Ranjani	Madhyā			Madhyā	Ranjani	6
7	Ratikā	Mṛdu	रि D	रि D	Mṛadu	Ratikā	7
8	Roudri	Diptā			Diptā	Roudri	8
9	Krodhā	Ayatā	ग E	ग E	Ayatā	Krodhā	9
10	Wajrikā	Diptā			Diptā	Wajrikā	10
11	Prasārini	Ayatā			Ayatā	Prasārini	11
12	Preeti	Mṛdu			Mṛdu	Preeti	12
13	Mārjani	Madhyā	स F	स F	Madhyā	Mārjani	13
14	Kshiti	Mṛdu			(omitted as discordant)		0
15	Raktā	Madhyā			Mṛadu	Kshiti	14
16	Sandipani	Ayatā			Madhyā	Raktā	15
17	Ālāpini	Karuṇā	प G	प G	Ayatā	Sandipani	16
0	(omitted as discordant)				Karuṇā	Ālāpini	17
18	Madanti	Karuṇā			Karuṇā	Madanti	18
19	Rohini	Ayatā			Ayatā	Rohini	19
20	Ramyā	Madhyā	ध A	ध A	Madhyā	Ramyā	20
21	Ugrā	Diptā			Diptā	Ugrā	21
22	Kshobhiṇi	Madhyā	नि 1	नि B	Madhyā	Kshobhiṇi	22
1	Tivrā	Diptā			Diptā	Tivrā	1
2	Kumudwati	Ayatā			Ayatā	Kumudwati	2
3	Mandā	Mṛdu			Mṛdu	Mandā	3
4	Chandowati	Madhyā	स C	स C	Madhyā	Chandowati	4

EXPOSITION OF 22 S'RUTIS

Supplement II Table showing the result of the gradual decrease of 1 to 4 S'rutis of the Madhyama Grāma Veṇa of Bharata which is named Dhruva Veṇa by Mataṅga.

S. number of S'rutis.	If one S'ruti is reduced from the Madhyama Grāma no S'ruti is gained i. e. no two notes coincide with each other.	If two S'rutis are reduced, ग coincides with रि and नि with ध, each of them gaining 2 S'rutis, in all 4 S'rutis.	If three S'rutis are reduced, रि coincides with स, and ध with ग, each gaining three S'rutis, in all 6 S'rutis.	If four S'rutis are reduced, ग coincides with म, and स with नि, each gaining 4 S'rutis, in all 12 S'rutis.
पद्ज मध्यम	पद्ज मध्यम	पद्ज मध्यम	पद्ज मध्यम	पद्ज मध्यम
ग्राम ग्राम	ग्राम ग्राम	ग्राम ग्राम	ग्राम ग्राम	ग्राम ग्राम
वीणा वीणा	वीणा वीणा	वीणा वीणा	वीणा वीणा	वीणा वीणा
4	स	स	स	स
5	स	स	स	स
6	स	स	स	स
7	रि	रि	रि	रि
8	रि	रि	रि	रि
9	ग	ग	ग	ग
10	ग	ग	ग	ग
11	ग	ग	ग	ग
12	ग	ग	ग	ग
13	म	म	म	म
14	म	म	म	म
15	म	म	म	म
16	प	प	प	प
17	प	प	प	प
18	प	प	प	प
19	ध	ध	ध	ध
20	ध	ध	ध	ध
21	ध	ध	ध	ध
22	नि	नि	नि	नि
1	नि	नि	नि	नि
2	नि	नि	नि	नि
3	नि	नि	नि	नि
4	स	स	स	स
4	स	स	स	स
6	स	स	स	स
12	स	स	स	स

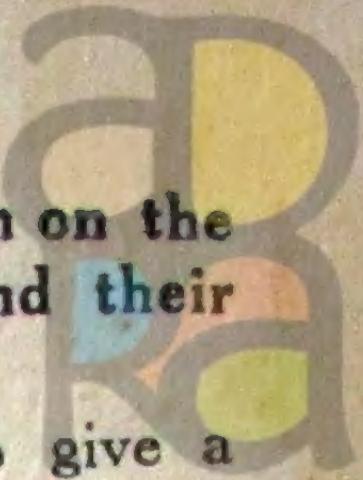
Thus $4 + 6 + 12 = 22$ S'rutis.

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